

### **Remarks/Arguments**

Applicants have received and carefully reviewed the Final Office Action of the Examiner mailed December 14, 2009. Currently, claims 29, 31-34, 36-37, 39-45, 47-56, and 58-70 remain pending. Favorable consideration of the following remarks is respectfully requested.

#### ***Declaration under 37 CFR §1.131***

The Examiner states that the previously submitted Declaration was reviewed and not found to be convincing because the Invention Record listed “n/a” under a heading of reduction to practice, and the declaration was unsigned. Applicants submit herewith a copy of the previously filed Declaration, with signatures. Also filed herewith is a Supplemental Declaration with an attached Exhibit 2. Exhibit 2 includes copies of certain pages from a report entitled “AMPGen: Active Micro Power Generator”, with dates removed. As seen from the title page, this is a quarterly status report relating to a government contract (Contract Number F33615-01-C-2171). It is pointed out that in the Preliminary Amendment filed in the present application on May 4, 2004, the first page of the specification was amended to include a reference to this same government contract (Contract Number F33615-01-C-2171). The record thus shows that the present specification relates to the AMPGen program.

On the second page of the provided report pages, and in the last paragraph, the report states, “... a fuel cell was constructed, shown in fig. 9.” The third provided report page further describes the fuel cell, shows the fuel cell in fig. 9, and provides a table (fig. 10) showing the results of testing the fuel cell. The Supplemental Declaration of the inventors submitted herewith states:

From the dates set forth on the AMPGen report (which have been redacted from the attached copy), we can tell that the fuel cell shown in FIG. 9 was made and tested prior to April 30, 2003. The fuel cell shown in FIG. 9 was made in accordance with the invention and was tested and found suitable for its intended purpose as shown in FIG. 10. The report shows that the invention of the above-identified patent application was completed prior to April 30, 2003.

Certainly, the combination of the two 1.131 Declarations show completion of a fuel cell made in accordance with the presently claimed methods, prior to April 30, 2003, and reduced to practice prior to the effective date of the Leban reference.

### ***Claim Rejections – 35 USC § 103***

Claims 29, 31-34, 36, 37, 39-45, 47, 48, 54-56, and 58-70 were rejected under 35 U.S.C. 103(a) as being unpatentable over Leban (U.S. Patent No. 7,049,024) in view of Blunk et al. (U.S. Patent No. 6,942,941).

Applicants respectfully disagree that claims 29, 31-34, 36, 37, 39-45, 47, 48, 54-56, and 58-70 are obvious in view of Leban and Blunk et al. For example, claim 47 recites:

47. (Previously Presented) A fuel cell comprising:  
a first electrode comprising:  
    a non-conductive substrate, the non-conductive substrate having a first electrode top surface, a first electrode bottom surface, and a first electrode thickness defined by a first distance between the first electrode top surface and the first electrode bottom surface;  
    a first electrode aperture through the first electrode thickness defined by a first electrode aperture surface;  
a second electrode comprising:  
    a second electrode top surface;  
    a second electrode bottom surface;  
    a second electrode thickness defined by a second distance between the second electrode top surface and the second electrode bottom surface;  
    a second electrode aperture through the second electrode thickness defined by a second electrode aperture surface;  
a first conductive layer provided on at least a portion of the first electrode top surface, at least a portion of the first electrode bottom surface, and one or more of at least a portion of the first electrode aperture surface, wherein the first conductive layer on the one or more of the at least a portion of the first electrode aperture surface provides an electrical connection between the first conductive layer on the first electrode top surface and the first conductive layer on the first electrode bottom surface;  
a second conductive layer provided on at least a portion of the second electrode top surface;  
a proton exchange member in electrical contact with and disposed between the first conductive layer and the second conductive layer, the proton exchange member including a catalyst;  
wherein, the first electrode aperture is at least partially aligned with the second electrode aperture, thereby exposing the proton exchange member.

Nothing in Leban or Blunk et al. appear to disclose many of the elements of claim 47 including, for example, “a first conductive layer provided on at least a portion of the first electrode top surface, at least a portion of the first electrode bottom surface, and one or more of at least a

portion of the first electrode aperture surface, wherein the first conductive layer on the one or more of the at least a portion of the first electrode aperture surface provides an electrical connection between the first conductive layer on the first electrode top surface and the first conductive layer on the first electrode bottom surface”.

In the Office Action, the Examiner appears to rely on the bipolar plates of Blunk et al. as disclosing “a first conductive layer provided on at least a portion of the first electrode top surface, at least a portion of the first electrode bottom surface, and one or more of at least a portion of the first electrode aperture surface, wherein the first conductive layer on the one or more of the at least a portion of the first electrode aperture surface provides an electrical connection between the first conductive layer on the first electrode top surface and the first conductive layer on the first electrode bottom surface”. Applicants respectfully disagree.

In the Office Action, the Examiner interprets the bipolar plate of Blunk et al. to be the same as the electrodes. Applicants respectfully disagree. Blunk et al. discloses “two individual proton exchange membrane (PEM) fuel cells connected to form a stack having a pair of membrane-electrode-assemblies (MEAs) 4, 6 separated from each other by an electrically conductive, liquid cooled, bipolar separator plate conductive element 8”. (Column 3, line 67 through column 4, line 5). Blunk et al. continues “a preferred bipolar separator plate 8 typically has two electrically active sides 20, 21 within the stack, each active side 20, 21 respectively facing a separate MEA 4, 6 with opposite charges that are separated, hence so-called ‘bipolar’ plate”. (Column 4, lines 7-12). As such, the MEAs 4 and 6 would appear to correspond to the electrodes of Leban and the bipolar separator plate would appear to correspond to the proton exchange membrane separating the electrodes. Thus, it is not understood how the bipolar separator plate is considered the claimed electrodes, as suggested by the Examiner, when Blunk et al. clearly teaches the bipolar separator plate separating the electrode assemblies.

Further, as noted above, the opposite charges of the bipolar separator plate are separated, which is clearly shown in Figures 4-6 of Blunk et al. Hence, nothing in Blunk et al. appears to disclose a first conductive layer provided on at least a portion of one or more of at least a portion of the first electrode aperture surface that provides an electrical connection between the first conductive layer on the first electrode top surface and the first conductive layer on the first electrode bottom surface.

Further, even if the bipolar plates of Blunk et al. could be considered as teaching the

claimed first electrode and second electrode (which Applicants believe they do not), Applicants respectfully assert that there is no reason to modify the teaching of Leban to include the bipolar plates of Blunk et al. As understood from the Supreme Court's decision under KSR, there must be some reason to make the claimed combination. MPEP § 2141 states:

The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 550 U.S. at \_\_\_, 82 USPQ2d at 1396.

(Emphasis added). The Office Action states "it would be desirable to use conductively coated polymer plates, such as those of Blunk et al., instead of entirely conductive plates, such as those of Leban, since such a substitution may result in a lighter fuel cell in the instance that the coated plates of Blunk et al. are lighter than the plates of Leban, or in a less expensive fuel cell in the instance that the materials of the plates of Blunk et al. are less expensive than those of Leban". Clearly this assertion does not provide the required articulated reasoning with rational underpinning to support the legal conclusion of obviousness, as required by *KSR*. There is no indication that the proposed substitution would result in a lighter fuel cell or a less expensive fuel cell as argued by the Examiner. For these and other reasons, claim 47, as well as all claims dependent therefrom, are believed to be clearly patentable over Leban and Blunk et al.

Despite the foregoing, and to advance prosecution in a timely manner, enclosed herewith is a signed copy of the previously filed Declaration under 37 C.F.R. § 1.131, together with a Supplemental Declaration under 37 CFR §1.131, showing completion of the invention prior to the April 30, 2003 filing date of Leban. It is believed that the enclosed 1.131 Declarations remove the Leban patent as a reference. Additionally, Blunk et al. was filed on August 6, 2003, which is after the filing date of Leban. As such, it is believed that the 1.131 Declarations also remove the Blunk et al. patent as a reference. For these and other reasons, all pending claims 29, 31-34, 36, 37, 39-45, 47, 48, 54-56, and 58-70 are believed to be clearly patentable over Leban in view of Blunk et al.

Claims 49-53 were rejected under 35 U.S.C. 103(a) as being unpatentable over Leban in view of Blunk et al., and further in view of Badding et al. (U.S. Publication No. 2002/0102450).

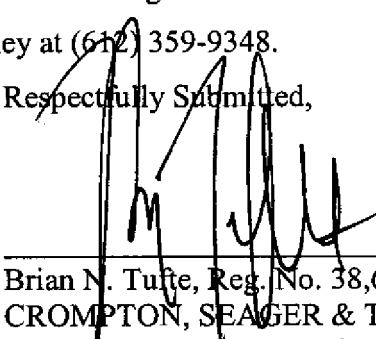
After careful review, Applicants respectfully disagree. As discussed previously, claim 47 is believed to be patentable over Leban and Blunk et al. and nothing in Badding et al. appears to remedy the noted shortcomings. Also, the 1.131 Declarations, showing completing of the instant invention prior to April 30, 2003, remove the Leban and Blunk et al. patents as references. Therefore, for at least these reasons, claims 49-53, which depend from claim 47 and include significant additional distinguishing features, are believed to be clearly patentable over Leban in view of Blunk et al. and further in view of Badding et al.

### ***Conclusion***

In view of the foregoing, all pending claims 29, 31-34, 36-37, 39-45, 47-56, and 58-70 are believed to be in a condition for allowance. Reconsideration and withdrawal of the rejection are respectfully requested. If a telephone conference might be of assistance, the Examiner is encouraged to contact the undersigned attorney at (612) 359-9348.

Respectfully Submitted,

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